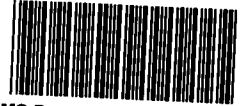





UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
ENVIRONMENTAL SCIENCE CENTER
701 MAPES ROAD
FORT MEADE, MD 20755-5350



SDMS DocID

2209992

ORIGINAL

DATE : December 16, 2002
SUBJECT: Region III Data QA Review
FROM : Fredrick Foreman 
Region III ESAT RPO (3ES20)
TO : Lorie Baker
Regional Project Manager (3HS34)

Attached is the inorganic data validation report for the Elkton Farm site (Case #: 31029, SDG#: MC00P7, MC00Q8, MC00R6) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 305-2629.

Attachments

cc: Alex Cox (MDE)

TO File #: 0007

TDF#: 1063

OFFICE OF ANALYTICAL SERVICES AND QUALITY ASSURANCE

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DATE: December 3, 2002

SUBJECT: Inorganic Data Validation (IM2 Level)
Case: 31029
SDGs: MC00P7, MC00Q8, MC00R6
Site: Elkton Farm

FROM: Kenneth W. Curry *KWC* Inorganic Data Reviewer
Mahboobeh Mecanic *M.M.* Senior Oversight Chemist

TO: Fredrick Foreman
ESAT Region 3 Project Officer

OVERVIEW

Case 31029, Sample Delivery Groups (SDGs) MC00P7, MC00Q8 and MC00R6, from the Elkton Farm site consisted of six (6) aqueous and thirty (30) soil samples analyzed for total metals and cyanide (CN⁻) by Sentinel Incorporated (SENTIN). The sample set included one (1) aqueous field duplicate pair and two (2) soil field duplicate pairs. Samples were analyzed in accordance with Contract Laboratory Program (CLP) Statement of Work (SOW) ILM04.1 through Routine Analytical Services (RAS) program.

SUMMARY

All samples were successfully analyzed for all Target Analyte List (TAL) parameters. Areas of concern with respect to data usability are listed below.

Data in this case have been impacted by outliers present in laboratory blanks, sample preservation, sample cooler chest temperature as well as matrix spike, laboratory duplicate, ICP serial dilution, laboratory control sample and Contract Required Detection Limit (CRDL) standard analyses. Details of these outliers are discussed under "Minor Problems"; specific samples affected are outlined in "Table 1A" and qualified analytical results for all samples are summarized on Data Summary Forms (DSFs).

MINOR PROBLEMS

The preparation blank had a negative value greater than the absolute value of the Instrument Detection Limit (IDL) for beryllium (Be) while a continuing calibration blank had a negative value greater than the absolute value of the IDL for magnesium (Mg) in SDG MC00Q8. Reported results less than two times (<2X) the absolute value of the blank and quantitation limits for these analytes in affected samples in this SDG may be biased low and have been qualified "L" and "UL", respectively, on the DSFs unless superseded by "J" or "B".

Continuing Calibration (CCB) Blanks had reported results greater than IDLs for Be and cadmium (Cd) in SDG MC00Q8 as well as for Be in SDG MC00R6. Reported results for these analytes in affected samples which are less than or equal to five times ($\leq 5X$) blank concentrations may be biased high and have been qualified "B" on DSFs.

CRDL standard recoveries were low ($<90\%$) for selenium (Se) in SDG MC00P7 and thallium (Tl) in SDG MC00Q8. Low recoveries may indicate negative biases for results detected near detection limits due to an unstable baseline. Reported results which are $<2X$ CRDL and quantitation limits for these analytes in affected samples may be biased low and have been qualified "L" and "UL", respectively, on the DSFs.

CRDL standard recoveries were high ($>110\%$) for arsenic (As), cadmium (Cd), Se and zinc (Zn) in SDG MC00Q8 and As and Se in SDG MC00R6. High recoveries may indicate positive biases for results detected near detection limits due to an unstable baseline. Reported results which are $<2X$ CRDL for these analytes in affected samples may be biased high and have been qualified "K" on the DSFs unless superseded by "J" or "B".

Matrix spike recoveries were low ($<75\%$) for antimony (Sb) in SDG MC00Q8 and for manganese (Mn) and Se in SDG MC00R6. Reported results and quantitation limits for these analytes in these SDGs may be biased low and have been qualified "L" and "UL", respectively, on the DSFs unless superseded by "J" or "B".

Matrix spike recovery was high ($>125\%$) for Se in SDG MC00Q8. Reported results for this analyte in this SDG may be biased high and have been qualified "K" on the DSFs.

Percent Differences (%Ds) for ICP serial dilution analyses were outside control limits ($>10\%$) for potassium (K) in SDG MC00P7 and for calcium (Ca), magnesium (Mg) and K in SDG in SDG MC00Q8. Reported results for these analytes are estimated and have been qualified "J" on the DSFs.

The Relative Percent Difference (RPD) for the laboratory duplicate analysis was outside control limits (35% RPD, ± 2 CRDL) for Mn in SDG MC00R6. Reported results for this analyte in this SDG are estimated and have been qualified "J" on the DSFs.

Samples MC00P7 and MC00Q1 (SDG MC00P7), collected for total metals and cyanide (CN⁻) analyses, had a pH of 7.0 as measured by the laboratory upon sample receipt. Reported results and quantitation limits for all analytes in these samples may be biased low and have been qualified "L" and "UL", respectively, on the DSFs unless superseded by "J".

CRDL standard recoveries were high ($>110\%$) while the matrix spike recovery was low ($<75\%$) for Se in SDG MC00R6, producing opposing bias effects for results detected near the detection limit. Reported results for this analyte in this SDG which are less than $2X$ CRDL are estimated and have been qualified "J" on the DSFs.

A sample cooler chest containing samples from all three (3) SDGs had an interior temperature of 6.5 °C when received by the laboratory. Quantitation limits for CN⁻ in the affected aqueous samples in SDG MC00P7 may be biased low and have been qualified "UL" on the DSFs. Due to thermostability of metals and CN⁻ in the soil matrix, no other data were qualified based on the sample cooler chest temperature.

Recoveries of sodium (Na) in soil Laboratory Control Sample (LCS) analyses were outside the upper control limit in SDGs MC00Q8 and MC00R6. Reported results for this analyte in these SDGs may be biased high and have been qualified "K" on the DSFs.

NOTES

Laboratory duplicate results for aluminum (Al), iron (Fe) and lead (Pb) in SDG MC00R6 were outside the contractual control limit of 20% RPD, \pm CRDL. However, the results for these analytes were within the control limit of 35% RPD, \pm 2XCRDL utilized for data validation of soil samples in Region 3. No data were qualified based on these outliers.

Reported results for the soil field duplicate pair, samples MC00Q8/MC00R4, were within 35% RPD, \pm 2XCRDL for all analytes except for As, copper (Cu), Fe, Pb, Mn, Se and Zn, soil field duplicate pair, samples MC00S9/MC00T5, were within 35% RPD, \pm 2XCRDL for all analytes except Mn. The aqueous field duplicate pair, samples MC00P7/MC00Q1, were within 20% RPD, \pm CRDL for all analytes. No data were qualified based on field duplicate pair precision.

In SDG MC00R6 all samples were reanalyzed for Mn and Tl. No apparent reason was evident for these reanalyses.

Data for Case 31029, SDGs MC00P7, MC00Q8 and MC00R6, were reviewed in accordance with National Functional Guidelines for Evaluating Inorganic Analyses with Modification for use within Region III.

ATTACHMENTS

INFORMATION REGARDING REPORT CONTENT

Table 1A is a summary of qualifiers applied to the laboratory-generated results during data validation.

TABLE 1A	SUMMARY OF QUALIFIERS ON DATA SUMMARY FORMS AFTER DATA VALIDATION
TABLE 1B	CODES USED IN COMMENTS COLUMN OF TABLE 1A
APPENDIX A	GLOSSARY OF DATA QUALIFIER CODES
APPENDIX B	DATA SUMMARY FORMS
APPENDIX C	CHAIN OF CUSTODY (COC) RECORDS
APPENDIX D	LABORATORY CASE NARRATIVES

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

CASE: 31029

SDG#: MC00P7

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Al	MC00P7, MC00Q1	L		Low	pH (7.0)
Sb	MC00P7, MC00Q1		UL	Low	pH (7.0)
As	MC00P7, MC00Q1		UL	Low	pH (7.0)
Ba	MC00P7, MC00Q1	L		Low	pH (7.0)
Be	MC00P7, MC00Q1		UL	Low	pH (7.0)
Cd	MC00P7, MC00Q1		UL	Low	pH (7.0)
Ca	MC00P7, MC00Q1	L		Low	pH (7.0)
Cr	MC00P7, MC00Q1		UL	Low	pH (7.0)
Co	MC00P7, MC00Q1		UL	Low	pH (7.0)
Cu	MC00P7, MC00Q1	L		Low	pH (7.0)
Fe	MC00P7, MC00Q1	L		Low	pH (7.0)
Pb	MC00P7, MC00Q1		UL	Low	pH (7.0)
Mg	MC00P7, MC00Q1	L		Low	pH (7.0)
Mn	MC00P7, MC00Q1	L		Low	pH (7.0)
Hg	MC00P7, MC00Q1		UL	Low	pH (7.0)
Ni	MC00P7, MC00Q1	L	UL	Low	pH (7.0)
K	MC00P7, MC00Q1	J			ISD(56.3%) pH (7.0)

* See explanation of Comments on Table 1B.

**TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION**

CASE: 31029

SDG#: MC00P7

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
K	MC00P6, MC00P8, MC00P9, MC00Q0	J			ISD(56.3%)
Se	MC00P7, MC00Q1		UL	Low	CRL(80.2%) pH (7.0)
	MC00P6, MC00P8, MC00P9, MC00Q0		UL	Low	CRL(80.2%)
Ag	MC00P7, MC00Q1		UL	Low	pH (7.0)
Na	MC00P7, MC00Q1	L		Low	pH (7.0)
Tl	MC00P7, MC00Q1		UL	Low	pH (7.0)
V	MC00P7, MC00Q1		UL	Low	pH (7.0)
Zn	MC00P7, MC00Q1	L		Low	pH (7.0)
CN	MC00P7, MC00Q1		UL	Low	pH (7.0) CHT(6.5 °C)
	MC00P8, MC00P9, MC00Q0		UL	Low	CHT(6.5 °C)

* See explanation of Comments on Table 1B.

**TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION**

CASE: 31029

SDG#: MC00Q8

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
Sb	All Samples	L	UL	Low	MSL(42.1%)
As	MC00R1, MC00R2, MC00R4, MC00R7	K		High	CRH(113.4%, 112.3%)
	MC00Q5, MC00R3, MC00S4, MC00T8	K		High	CRH(112.3%, 119.8%)
Be	MC00S1		UL	Low	PBN(-0.048 mg/Kg)
	MC00S5	B		High	CCB(0.3 µg/L) PBN(-0.048 mg/Kg)
	MC00S4	B		High	CCB(0.3 µg/L)
Cd	MC00Q5, MC00Q6, MC00Q7, MC00R3, MC00S2, MC00S3, MC00S4, MC00S5, MC00T3, MC00T5, MC00T8	B		High	CCB(1.1 µg/L) CRH(111.3%)
	MC00R2, MC00R4	B		High	CCB(0.8 µg/L) CRH(111.3%)
	MC00Q8, MC00R1, MC00R5, MC00R7	K		High	CRH(111.3%)
Ca	All Samples	J			ISD(22.8%)
Mg	All Samples Except MC00S5	J			ISD(15.8%)
	MC00S5	J			ISD(15.8%) CBN(-78.7 µg/L)

* See explanation of Comments on Table 1B.

**TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION**

CASE: 31029

SDG#: MC00Q8

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON- DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
K	All Samples	J			ISD(40.0%)
Se	MC00Q9, MC00R0, MC00R2	K		High	MSH(128.6%) CRH(113.5%)
	MC00Q5, MC00Q6, MC00Q7, MC00R5, MC00S2, MC00S3, MC00S4, MC00T3, MC00T5	K		High	MSH(128.6%) CRH(123.4%)
	MC00Q8	K		High	MSH(128.6%)
Na	All Samples	K		High	LCH(557.3%)
Tl	MC00Q5, MC00Q6, MC00Q7, MC00R3, MC00R5, MC00S1, MC00S2, MC00S3, MC00S4, MC00S5, MC00T3, MC00T8	L	UL	Low	CRL(84.1%)
Zn	MC00S1, MC00S5	K		High	CRH(117.4%)

* See explanation of Comments on Table 1B.

TABLE 1A
SUMMARY OF QUALIFIERS ON DATA SUMMARY
FORM AFTER DATA VALIDATION

CASE: 31029

SDG#: MC00R6

<u>ANALYTE</u>	<u>SAMPLES AFFECTED</u>	<u>POSITIVE VALUES</u>	<u>NON-DETECTED VALUES</u>	<u>BIAS</u>	<u>COMMENTS*</u>
As	All Samples Except MC00S8, MC00S9, MC00T6, MC00T9	K		High	CRH(117.4%, 112.1%)
	MC00S9, MC00T6, MC00T9	K		High	CRH(112.1%)
Be	MC00T4	B		High	CCB(0.3 µg/L)
Mn	All Samples	J			DUP(37.8%) MSL(64.2%)
Se	MC00R8, MC00S0, MC00S6, MC00S8, MC00T2	B		High	CCB(4.0 µg/L) MSL(72.6%) CRH(143.4%, 119.2%)
	MC00S9, MC00T6, MC00T9	J		Mixed	MSL(72.6%) CRH(119.2%, 114.3%)
	MC00R6, MC00T4		UL	Low	MSL(72.6%)
Na	All Samples	K		High	LCH(534.5%)

* See explanation of Comments on Table 1B.

TABLE 1B
CODES USED IN COMMENTS COLUMN

pH	=	The sample pH was greater than two for metals and less than twelve for cyanide (>2, <12) as measured by the laboratory (pH is in parenthesis). Reported results and quantitation limits may be biased low.
ISD	=	Percent differences (%Ds) for ICP serial dilution analyses exceeded control limits (10%) [% Ds are in parenthesis]. Reported results are estimated.
CRL	=	CRDL standard recoveries were low (<90%) [% recoveries are in parenthesis]. Reported results which are <2XCRDL and quantitation limits may be biased low.
CHT	=	The sample cooler temperature was outside the required temperature range (4 °C ±2 °C) [sample cooler temperature is in parenthesis]. Quantitation limits may be biased low.
MSL	=	Matrix spike recoveries were low (<75%) [% recoveries are in parenthesis]. Reported results and quantitation limits may be biased low.
CRH	=	CRDL standard recoveries were high (>110) [% recoveries are in parenthesis]. Reported results which are <2XCRDL may be biased high.
PBN	=	The preparation blank had a negative result with an absolute value greater than the IDL (result is in parenthesis). Reported results less than two times (<2X) the absolute value of the blank and quantitation limits may be biased low.
CCB	=	Continuing calibration blanks had results > IDLs (results are in parenthesis). Reported results which are less than five times (<5X) the blank concentration may be biased high.
CBN	=	A continuing calibration blank had a negative result with an absolute values greater than the IDL (result is in parenthesis). Reported results less than two times (<2X) the absolute value of the blank may be biased low.
MSH	=	The matrix spike recovery was high (>125%) [% recovery is in parenthesis]. Reported results may be biased high.
LCH	=	Laboratory control sample recoveries were high (>125%) [% recoveries are in parenthesis]. Reported results may be biased high.
DUP	=	The Relative Percent Difference (RPD) for a laboratory duplicate analysis was the outside control limits (20% RPD, ±CRDL) [RPD is in parenthesis]. Reported results are estimated.

APPENDIX A

Glossary of Qualifier Codes

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION

(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION

(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low.
Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

APPENDIX B
Data Summary Forms

DATA SUMMARY FORM: INORGANIC

Page 1 of 8

Case #: 31029

SDG : MC00P7

Number of Soil Samples : 0

Site :

ELKTON FARM

Number of Water Samples : 6

Lab. :

SENTIN

Sample Number :		MC00P6 SW1		MC00P7 SW2 Field Dup. of MC00Q1		MC00P8 SW3		MC00P9 SW4		MC00Q0 SW5	
Sampling Location :											
Field QC:											
Matrix :		Water		Water		Water		Water		Water	
Units :		ug/L		ug/L		ug/L		ug/L		ug/L	
Date Sampled :		10/09/2002		10/08/2002		10/08/2002		10/08/2002		10/08/2002	
Time Sampled :		09:25		13:25		11:15		10:40		09:50	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	269		269	L	324		380		407	
ANTIMONY	60				UL						
*ARSENIC	10				UL						
BARIUM	200	[65.9]		[49.5]	L	[74.1]		[38.9]		[35.0]	
BERYLLIUM	5				UL			[0.25]			
*CADMIUM	5				UL						
CALCIUM	5000	10100		9160	L	9550		5300		13800	
*CHROMIUM	10				UL						
COBALT	50	[3.4]			UL	[3.4]		[4.2]			
COPPER	25	[1.3]		[1.3]	L	[1.9]		[1.3]		[1.8]	
IRON	100	1960		941	L	2510		3570		365	
*LEAD	3				UL						
MAGNESIUM	5000	[4870]		[4270]	L	[4800]		[2800]		8800	
MANGANESE	15	481		161	L	749		384		43.1	
MERCURY	0.2				UL						
*NICKEL	40	[2.5]			UL	[3.3]		[3.8]		[1.9]	
POTASSIUM	5000	[3390]	J	[3760]	J	[3550]	J	[1940]	J	5020	J
SELENIUM	5		UL		UL		UL		UL		UL
SILVER	10				UL						
SODIUM	5000	27000		20300	L	19800		6670		16700	
THALLIUM	10				UL						
VANADIUM	50				UL						
ZINC	20	[6.3]		[2.9]	L	[4.7]		[2.8]			
*CYANIDE	10				UL		UL		UL		UL

CRDL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 2 of 8

Case #: 31029

SDG : MC00P7

Site :

ELKTON FARM

Lab. :

SENTIN

Sample Number :		MC00Q1									
Sampling Location :		SW6									
Field QC:		Field Dup. of MC00P7									
Matrix :		Water									
Units :		ug/L									
Date Sampled :		10/08/2002									
Time Sampled :		13:30									
Dilution Factor :		1.0									
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	200	261	L								
ANTIMONY	60		UL								
*ARSENIC	10		UL								
BARIUM	200	[50.3]	L								
BERYLLIUM	5		UL								
*CADMIUM	5		UL								
CALCIUM	5000	8710	L								
*CHROMIUM	10		UL								
COBALT	50		UL								
COPPER	25	[1.6]	L								
IRON	100	936	L								
*LEAD	3		UL								
MAGNESIUM	5000	[4140]	L								
MANGANESE	15	184	L								
MERCURY	0.2		UL								
*NICKEL	40	[2.8]	L								
POTASSIUM	5000	[3810]	J								
SELENIUM	5		UL								
SILVER	10		UL								
SODIUM	5000	20200	L								
THALLIUM	10		UL								
VANADIUM	50		UL								
ZINC	20	[2.7]	L								
*CYANIDE	10		UL								

CRDL = Contract Required Quantitation Limit

*Action Level Exists

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 3 of 8

Case #: 31029

SDG: MC00Q8

Number of Soil Samples: 20

Site:

ELKTON FARM

Number of Water Samples: 0

Lab.:

SENTIN

Sample Number :	MC00Q5		MC00Q6		MC00Q7		MC00Q8		MC00Q9		
Sampling Location :	S1		S10		S11		S12		S13		
Field QC:							Field Dup. of MC00R4				
Matrix :	Soil		Soil		Soil		Soil		Soil		
Units :	mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg		
Date Sampled :	10/09/2002		10/09/2002		10/09/2002		10/08/2002		10/08/2002		
Time Sampled :	09:40		11:50		12:10		11:45		13:05		
%Solids :	86.2		84.7		82.7		84.2		86.8		
Dilution Factor :	1.0		1.0		1.0		1.0		1.0		
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	11400		9460		13000		7520		10200	
ANTIMONY	12		UL	[0.97]	L		UL	[2.9]	L	[1.5]	L
ARSENIC	2	2.7	K	4.8		4.9		9.0		4.9	
BARIUM	40	[26.7]		51.2		70.2		91.9		311	
BERYLLIUM	1	[0.62]		[0.68]		[0.81]		[0.91]		[1.1]	
CADMIUM	1	[0.53]	B	[0.52]	B	[0.69]	B	1.5	K	3.3	
CALCIUM	1000	[367]	J	[585]	J	[1010]	J	[915]	J	1610	J
CHROMIUM	2	25.1		16.7		20.7		15.2		21.2	
COBALT	10	12.9		[5.4]		[7.4]		[10.2]		[6.7]	
COPPER	5	17.0		8.8		10.9		88.1		170	
IRON	20	26100		14000		18400		39200		20600	
LEAD	0.6	12.3		15.3		14.1		22.9		305	
MAGNESIUM	1000	[1040]	J	1200	J	1720	J	[1080]	J	1380	J
MANGANESE	3	164		210		273		899		485	
MERCURY	0.1							0.15		3.5	
NICKEL	8	[8.3]		[6.9]		9.7		12.7		11.4	
POTASSIUM	1000	[528]	J	[464]	J	[560]	J	[313]	J	[588]	J
SELENIUM	1	1.5	K	1.4	K	1.5	K	2.4	K	1.8	K
SILVER	2	[0.61]		[0.25]		[0.28]		[1.1]		[0.91]	
SODIUM	1000	[900]	K	[650]	K	[838]	K	1250	K	[1010]	K
THALLIUM	2	3.3	L		UL		UL	2.8		[2.3]	
VANADIUM	10	37.1		24.6		31.1		20.5		26.3	
ZINC	4	19.2		29.8		28.4		41.5		495	
CYANIDE	0.5										

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 4 of 8

Case #: 31029

SDG: MC00Q8

Site:

ELKTON FARM

Lab.:

SENTIN

Sample Number :	MC00R0	MC00R1	MC00R2	MC00R3	MC00R4						
Sampling Location :	S14	S2	S3	S4	S5						
Field QC:					Field Dup. of MC00Q8						
Matrix :	Soil	Soil	Soil	Soil	Soil						
Units :	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg						
Date Sampled :	10/08/2002	10/09/2002	10/08/2002	10/09/2002	10/08/2002						
Time Sampled :	11:25	12:50	09:45	11:25	11:40						
%Solids :	88.1	85.2	82.5	84.2	84.8						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	9770		8010		7270		7950		8300	
ANTIMONY	12	[4.1]	L		UL		UL		UL		UL
ARSENIC	2	5.8		2.7	K	2.7	K	[2.3]	K	2.8	K
BARIUM	40	1010		101		88.2		48.4		64.8	
BERYLLIUM	1	[0.54]		[0.70]		[0.75]		[0.71]		[0.88]	
CADMIUM	1	12.5		[0.58]	K	[0.31]	B	[0.37]	B	[0.48]	B
CALCIUM	1000	2070	J	1580	J	[658]	J	[488]	J	[888]	J
CHROMIUM	2	51.1		14.8		12.1		11.4		13.5	
COBALT	10	[5.1]		[5.9]		[4.8]		[3.8]		[8.8]	
COPPER	5	777		10.3		7.4		12.1		11.0	
IRON	20	19300		12700		10700		10700		12300	
LEAD	0.8	1480		18.2		11.2		13.3		15.3	
MAGNESIUM	1000	1380	J	1370	J	[843]	J	[799]	J	[1100]	J
MANGANESE	3	673		272		204		283		481	
MERCURY	0.1	0.18		[0.06]						[0.10]	
NICKEL	8	17.5		[7.1]		[4.7]		[5.8]		[8.0]	
POTASSIUM	1000	[546]	J	[482]	J	[289]	J	[322]	J	[351]	J
SELENIUM	1	[0.89]	K			[0.90]	K				
SILVER	2	[1.0]		[0.23]						[0.38]	
SODIUM	1000	1300	K	[611]	K	[601]	K	[643]	K	[638]	K
THALLIUM	2	[2.3]				[2.2]			UL	[1.5]	
VANADIUM	10	22.7		22.3		17.9		18.0		20.9	
ZINC	4	1250		27.7		25.1		28.2		28.4	
CYANIDE	0.5	[0.11]									

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

Page 5 of 8

Case #: 31029

SDG : MC00Q8

Site :

ELKTON FARM

Lab. :

SENTIN

Sample Number :	MC00R5			MC00R7			MC00S1			MC00S2			MC00S3		
Sampling Location :	S6			S6			SED2			SED3			SED4		
Field QC:															
Matrix :	Soil			Soil			Soil			Soil			Soil		
Units :	mg/Kg			mg/Kg			mg/Kg			mg/Kg			mg/Kg		
Date Sampled :	10/08/2002			10/08/2002			10/08/2002			10/08/2002			10/08/2002		
Time Sampled :	13:00			12:35			13:30			11:20			10:45		
%Solids :	85.0			83.8			72.1			72.7			71.7		
Dilution Factor :	1.0			1.0			1.0			1.0			1.0		
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag		
ALUMINUM	40	10200		8990		373		2050		1470					
ANTIMONY	12	[0.95]	L		UL		UL		UL		UL		UL		
ARSENIC	2	4.8		4.1	K										
BARIUM	40	688		139		[2.6]		[14.3]		[13.2]					
BERYLLIUM	1	[0.67]		[0.50]			UL	[0.48]		[0.59]					
CADMIUM	1	1.9	K	2.2	K			[0.58]	B	[0.44]	B				
CALCIUM	1000	[1070]	J	[942]	J	[127]	J	[616]	J	[501]	J				
CHROMIUM	2	21.6		17.6		[1.7]		13.4		6.7					
COBALT	10	[5.8]		[5.1]				[2.2]		[5.3]					
COPPER	5	31.3		35.0		[0.70]		[4.9]		[6.9]					
IRON	20	14800		13900		1220		15800		9210					
LEAD	0.6	49.4		142				3.8		3.6					
MAGNESIUM	1000	3340	J	1560	J	[53.7]	J	[414]	J	[349]	J				
MANGANESE	3	316		192		25.0		46.0		200					
MERCURY	0.1	[0.09]													
NICKEL	8	9.6		[7.5]				[3.3]		[3.0]					
POTASSIUM	1000	[518]	J	[717]	J	[90.9]	J	[159]	J	[148]	J				
SELENIUM	1	2.0	K					1.6	K	[1.1]	K				
SILVER	2	[1.5]		[0.31]				[0.38]							
SODIUM	1000	[888]	K	2360	K	[263]	K	[664]	K	[518]	K				
THALLIUM	2		UL				UL		UL		UL				
VANADIUM	10	25.8		23.3		[1.3]		20.2		15.8					
ZINC	4	335		4010		6.8	K	11.4		24.1					
CYANIDE	0.5	[0.31]													

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

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Case #: 31029

SDG: MC00Q8

Site:

ELKTON FARM

Lab.:

SENTIN

Sample Number:		MC00S4 SED5		MC00S5 SED6		MC00T3 SS3		MC00T5 SS5 Field Dup. of MC00S9		MC00T8 SS8	
Sampling Location:											
Field QC:											
Matrix:		Soil		Soil		Soil		Soil		Soil	
Units:		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled:		10/08/2002		10/08/2002		10/08/2002		10/08/2002		10/08/2002	
Time Sampled:		10:00		13:35		10:15		12:40		12:40	
%Solids:		23.5		75.0		73.6		71.7		88.5	
Dilution Factor:		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	11600		461		9630		4560		6880	
ANTIMONY	12		UL		UL		UL	[1.5]	L		UL
ARSENIC	2	[5.4]	K							2.7	K
BARIUM	40	[169]		[3.5]		96.4		[32.8]		[35.8]	
BERYLLIUM	1	[1.1]	B	[0.10]	B	1.5		[0.43]		[0.58]	
CADMIUM	1	[0.96]	B	[0.16]	B	[0.22]	B	1.5	B	[0.39]	B
CALCIUM	1000	[2150]	J	[108]	J	[904]	J	2400	J	[446]	J
CHROMIUM	2	26.4		[1.9]		17.0		72.3		13.6	
COBALT	10	[16.8]		[0.78]		[3.2]		[3.7]		[4.4]	
COPPER	5	25.6		[1.1]		[4.6]		15.2		10.6	
IRON	20	24100		2210		4530		61800		13400	
*LEAD	0.6	28.6		1.3		9.0		3.8		11.7	
MAGNESIUM	1000	[2590]	J	[34.5]	J	[751]	J	1860	J	1270	J
MANGANESE	3	1710		52.8		136		68.0		103	
MERCURY	0.1	[0.23]									
NICKEL	8	46.4				[5.3]		[4.6]		[5.5]	
POTASSIUM	1000	[1430]	J	[85.6]	J	[319]	J	[522]	J	[562]	J
SELENIUM	1	[2.9]	K			[1.2]	K	2.1	K		
SILVER	2							[1.7]		[0.21]	
SODIUM	1000	[1530]	K	[267]	K	[618]	K	1710	K	[714]	K
THALLIUM	2		UL		UL		UL	6.4			UL
VANADIUM	10	[29.1]		[3.0]		[10.9]		[12.4]		21.0	
ZINC	4	105		6.7	K	16.8		37.9		239	
CYANIDE	0.5										

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

DATA SUMMARY FORM: INORGANIC

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Case #: 31029

SDG: MC00R6

Number of Soil Samples: 10

Site:

ELKTON FARM

Number of Water Samples: 0

Lab.:

SENTIN

Sample Number :		MC00R8		MC00R8		MC00S0		MC00S6		MC00S8	
Sampling Location :		S7		S9		SED1		SS1		SS11	
Field QC:											
Matrix :		Soil		Soil		Soil		Soil		Soil	
Units :		mg/Kg		mg/Kg		mg/Kg		mg/Kg		mg/Kg	
Date Sampled :		10/09/2002		10/09/2002		10/09/2002		10/09/2002		10/09/2002	
Time Sampled :		11:00		10:30		09:30		10:00		12:15	
%Solids :		81.0		85.0		54.3		86.7		85.3	
Dilution Factor :		1.0		1.0		1.0		1.0		1.0	
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	7390		10300		1760		9520		12700	
ANTIMONY	12			[2.5]						[1.0]	
ARSENIC	2	[2.4]	K	3.4	K	[1.7]	K	[2.1]	K	4.7	
BARIUM	40	[47.3]		280		[27.8]		[25.1]		[46.5]	
BERYLLIUM	1	[0.71]		[0.88]		[0.39]		[1.0]		[0.54]	
CADMIUM	1			[0.36]				[0.47]		[0.16]	
CALCIUM	1000	[170]		[534]		[466]		[391]		[314]	
CHROMIUM	2	10.9		17.3		3.8		33.8		21.1	
COBALT	10	[4.3]		[7.4]		[5.6]		23.3		[3.5]	
COPPER	5	7.9		333		[3.5]		16.8		9.6	
IRON	20	9620		15100		6070		34600		17000	
LEAD	0.6	17.0		20.6		2.7		12.6		7.8	
MAGNESIUM	1000	[821]		1540		[248]		[550]		[1020]	
MANGANESE	3	239	J	301	J	421	J	289	J	72.5	J
MERCURY	0.1	[0.08]		0.16							
NICKEL	8	[6.2]		11.3		[3.2]		[8.7]		[6.2]	
POTASSIUM	1000	[327]		[759]		[188]		[353]		[461]	
SELENIUM	1		UL	1.4	B	[1.3]	B	1.2	B	[1.1]	B
SILVER	2	[0.26]						[0.75]		[0.26]	
SODIUM	1000	[563]	K	[724]	K	[465]	K	[969]	K	[613]	K
THALLIUM	2										
VANADIUM	10	16.7		24.6		[5.6]		31.4		25.6	
ZINC	4	25.1		184		24.6		20.9		13.8	
CYANIDE	0.5			[0.16]							

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

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DATA SUMMARY FORM: INORGANIC

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Case #: 31029

SDG : MC00R8

Site :

ELKTON FARM

Lab. :

SENTIN

Sample Number :	MC00S9	MC00T2	MC00T4	MC00T8	MC00T9						
Sampling Location :	SS12	SS2	SS4	SS6	SS9						
Field QC:	Field Dup. of MC00T5										
Matrix :	Soil	Soil	Soil	Soil	Soil						
Units :	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg						
Date Sampled :	10/08/2002	10/09/2002	10/09/2002	10/09/2002	10/09/2002						
Time Sampled :	12:45	12:55	14:40	13:00	10:40						
%Solids :	78.4	84.7	91.1	92.5	87.9						
Dilution Factor :	1.0	1.0	1.0	1.0	1.0						
ANALYTE	CRDL	Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag
ALUMINUM	40	4000		12700		1680		3890		9290	
ANTIMONY	12	[1.5]						[0.93]			
ARSENIC	2	[1.4]	K	3.4	K	[0.98]	K	[1.4]	K	2.9	K
BARIUM	40	[30.3]		55.6		[7.2]		[37.0]		[28.7]	
BERYLLIUM	1	[0.73]		[0.61]		[0.20]	B	[0.41]		[0.52]	
CADMIUM	1	[0.82]		[0.16]						[0.14]	
CALCIUM	1000	1960		[249]		[128]		[229]		[363]	
CHROMIUM	2	99.8		20.6		21.3		18.0		16.0	
COBALT	10	[5.7]		[4.7]		[2.0]		[4.8]		[4.1]	
COPPER	5	17.5		8.8		10.4		7.4		15.9	
IRON	20	75400		18800		6800		8270		14500	
LEAD	0.6	3.7		9.2		4.4		8.2		6.0	
MAGNESIUM	1000	1440		1850		[117]		[956]		1280	
MANGANESE	3	117	J	67.3	J	59.8	J	116	J	92.2	J
MERCURY	0.1										
NICKEL	8	[4.4]		[9.2]		[1.3]		[5.8]		[6.6]	
POTASSIUM	1000	[438]		[575]		[118]		[267]		[554]	
SELENIUM	1	1.5	J	[0.95]	B		UL	[0.95]	J	[0.85]	J
SILVER	2	[1.5]		[0.22]		[0.29]		[0.28]			
SODIUM	1000	1780	K	[752]	K	[353]	K	[402]	K	[603]	K
THALLIUM	2	[2.5]									
VANADIUM	10	19.5		30.0		[9.1]		12.4		24.5	
ZINC	4	28.0		19.8		5.2		25.6		24.2	
CYANIDE	0.5										

CRDL = Contract Required Quantitation Limit

SEE NARRATIVE FOR CODE DEFINITIONS

To calculate sample quantitation limits: (CRDL * Dilution Factor) / (%Solids/ 100)

Revised 09/99

APPENDIX C

Chain of Custody (COC) Records



USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 31029

DAS No: R31295

R

Region: 3	Date Shipped: 10/8/2002	Chain of Custody Record	Sampler Signature:
Project Code:	Carrier Name: FedEx		
Account Code: 02T03N50102D037ZLA00	Airbill: 818742449074	Relinquished By (Date / Time)	Received By (Date / Time)
CERCLIS ID: MDD985407196	Shipped to: Sentinel Inc. 116 Washington Street, NE Huntsville AL 35801 (256) 534-9800	1	
Spill ID:		2	
Site Name/State: Elkton Farm/MD		3	
Project Leader: Alex Cox		4	
Action: Expanded Site Investigation/RI			
Sampling Co: MDE			

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC00P7	Surface Water/ Dixon Wood DW	L/G	CN (21), TM (21)	1133 (HNO3), 1138 (NaOH) (2)	SW2	S: 10/8/2002	13:25	C00P7	-
MC00P8	Surface Water/ Dixon Wood DW	L/G	CN (21), TM (21)	1139 (HNO3), 1144 (NaOH) (2)	SW3	S: 10/8/2002	11:15	C00P8	-
MC00P9	Surface Water/ Dixon Wood DW	L/G	CN (21), TM (21)	1145 (HNO3), 1146 (HNO3), 1157 (NaOH), 1158 (NaOH) (4)	SW4	S: 10/8/2002	10:40	C00P9	Spike
MC00Q0	Surface Water/ Phillip Anderson PA	L/G	CN (21), TM (21)	1159 (HNO3), 1164 (NaOH) (2)	SW5	S: 10/8/2002	9:50	C00Q0	-
MC00Q1	Surface Water/ Phillip Anderson PA	L/G	CN (21), TM (21)	1165 (HNO3), 1170 (NaOH) (2)	SW6	S: 10/8/2002	13:30	C00Q1	Field Duplicate
MC00Q8	Surface Soil (0"-12") SM	L/G	TM/CN (21)	1189 (Ice Only) (1)	S12	S: 10/8/2002	11:45	C00Q8	Field Duplicate
MC00Q9	Surface Soil (0"-12") Scott Morgan	L/G	TM/CN (21)	1193 (Ice Only) (1)	S13	S: 10/8/2002	13:05	C00Q9	
MC00R0	Surface Soil (0"-12") Alex Cox AC	L/G	TM/CN (21)	1197 (Ice Only) (1)	S14	S: 10/8/2002	11:25	C00R0	
MC00R2	Surface Soil (0"-12") Alex Cox AC	L/G	TM/CN (21)	1208 (Ice Only) (1)	S3	S: 10/8/2002	9:45	C00R2	
MC00R4	Surface Soil (0"-12") Scott Morgan SM	L/G	TM/CN (21)	1216 (Ice Only) (1)	S5	S: 10/8/2002	11:40	C00R4	

Field Duplicate
OCT 2002
RECEIVED

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: MC00P9	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment lost? _____
CN = Cyanide, TM = CLP TAL Total Metals, TM/CN = CLP TAL Total Metals and Cyanide			

TR Number: 3-592370820-100802-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222



USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 31029
DAS No: R31295

R

Region: 3 Project Code: Account Code: 02T03N50102D037ZLA00 CERCLIS ID: MDD085407196 Spill ID: Site Name/State: Elkton Farm/MD Project Leader: Alex Cox Action: Expanded Site Investigation/RI Sampling Co: MDE	Date Shipped: 10/9/2002 Carrier Name: FedEx Airbill: 835304988550 Shipped to: Sentinel Inc. 116 Washington Street, NE Huntsville AL 35801 (256) 534-8800	Chain of Custody Record <table border="1"><tr><td>Relinquished By</td><td>(Date / Time)</td><td>Sampler Signature: </td><td>Received By</td><td>(Date / Time)</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td></tr><tr><td>2</td><td></td><td></td><td></td><td></td></tr><tr><td>3</td><td></td><td></td><td></td><td></td></tr><tr><td>4</td><td></td><td></td><td></td><td></td></tr></table>	Relinquished By	(Date / Time)	Sampler Signature:	Received By	(Date / Time)	1					2					3					4				
Relinquished By	(Date / Time)	Sampler Signature:	Received By	(Date / Time)																							
1																											
2																											
3																											
4																											

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT. DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC00P6	Surface Water/ Dixon Wood <i>DW</i>	L/G	CN (21), TM (21)	1127 (HNO ₃), 1132 (NaOH) (2)	SW1	S: 10/9/2002	9:25	C00P6	-
MC00Q5	Surface Soil (0"-12") Magalie Gelin <i>mg</i>	L/G	TM/CN (21)	1177 (Ice Only) (1)	S1	S: 10/9/2002	10:00 0940	C00Q5	-
MC00Q6	Surface Soil (0"-12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1181 (Ice Only) (1)	S10	S: 10/9/2002	11:50	C00Q6	-
MC00Q7	Surface Soil (0"-12") Alex Cox <i>AC</i>	L/G	TM/CN (21)	1185 (Ice Only) (1)	S11	S: 10/9/2002	12:10	C00Q7	-
MC00R1	Surface Soil (0"-12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1201 (Ice Only) (1)	S2	S: 10/9/2002	12:50	C00R1	Spike
MC00R3	Surface Soil (0"-12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1212 (Ice Only) (1)	S4	S: 10/9/2002	11:25	C00R3	-
MC00R5	Surface Soil (0"-12") Magalie Gelin <i>mg</i>	L/G	TM/CN (21)	1220 (Ice Only) (1)	S6	S: 10/9/2002	13:00	C00R5	-
MC00R6	Surface Soil (0"-12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1224 (Ice Only) (1)	S7	S: 10/9/2002	11:00	C00R6	-
MC00R8	Surface Soil (0"-12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1232 (Ice Only) (1)	S9	S: 10/9/2002	10:30	C00R8	-
MC00S0	Sediment/ Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1240 (Ice Only) (1)	SED1	S: 10/9/2002	9:30	C00S0	Spike

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: MC00R1, MC00S0	Additional Sampler Signature(s): 	Chain of Custody Seal Number:
Analysis Key: CN = Cyanide, TM = CLP TAL Total Metals, TM/CN = CLP TAL Total Metals and Cyanide	Concentration: L = Low, M = Low/Medium, H = High Type/Designate: Composite = C, Grab = G	Shipment Iced? _____	

TR Number: 3-592370820-100902-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20181-3400 Phone 703/264-9348 Fax 703/264-9222



USEPA Contract Laboratory Program Inorganic Traffic Report & Chain of Custody Record

Case No: 31029

DAS No: R31295

R

Region: 3	Date Shipped: 10/8/2002	Chain of Custody Record	Sampler Signature:		
Project Code:	Carrier Name: FedEx				
Account Code: 02T03N50102D037ZLA00	Airbill: 819742449074				
CERCLIS ID: MDD985407196	Shipped to: Sentinel Inc. 116 Washington Street, NE Huntsville AL 35801 (256) 534-9800				
Spill ID:					
Site Name/State: Elkton Farm/MD		Relinquished By	(Date / Time)	Received By	(Date / Time)
Project Leader: Alex Cox		1			
Action: Expanded Site Investigation/RI		2			
Sampling Co: MDE		3			
		4			

INORGANIC SAMPLE No.	MATRD/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC00R7	Surface Soil (0"-12") Alex Cox	L/G	TM/CN (21)	1228 (Ice Only) (1)	S8	S: 10/8/2002	12:35	C00R7	-
MC00S1	Sediment/ Dixon Wood	L/G	TM/CN (21)	1247 (Ice Only) (1)	SED2	S: 10/8/2002	13:30	C00S1	-
MC00S2	Sediment/ Philip Anderson	L/G	TM/CN (21)	1251 (Ice Only) (1)	SED3	S: 10/8/2002	11:20	C00S2	-
MC00S3	Sediment/ Philip Anderson	L/G	TM/CN (21)	1255 (Ice Only) (1)	SED4	S: 10/8/2002	10:45	C00S3	-
MC00S4	Sediment/ Philip Anderson	L/G	TM/CN (21)	1259 (Ice Only) (1)	SED5	S: 10/8/2002	10:00	C00S4	-
MC00S5	Sediment/ Philip Anderson	L/G	TM/CN (21)	1263 (Ice Only) (1)	SED6	S: 10/8/2002	13:35	C00S5	-
MC00S9	Subsurface Soil (>12") Scott Morgan	L/G	TM/CN (21)	1279 (Ice Only) (1)	SS12	S: 10/8/2002	12:45	C00S9	-
MC00T3	Subsurface Soil (>12") Scott Morgan	L/G	TM/CN (21)	1295 (Ice Only) (1)	SS3	S: 10/8/2002	10:15	C00T3	-
MC00T5	Subsurface Soil (>12") Scott Morgan	L/G	TM/CN (21)	1303 (Ice Only) (1)	SS5	S: 10/8/2002	12:40	C00T5	-
MC00T8	Subsurface Soil (>12") Alex Cox	L/G	TM/CN (21)	1315 (Ice Only) (1)	SS8	S: 10/8/2002	12:40	C00T8	-

Field Duplicate

OCT 2002

RECEIVED

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: MC00P9	Additional Sampler Signature(s): 	Chain of Custody Seal Number:
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced? _____
CN = Cyanide, TM = CLP TAL Total Metals, TM/CN = CLP TAL Total Metals and Cyanide			

TR Number: 3-592370820-100802-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

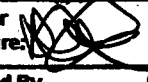
Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20191-3400 Phone 703/264-9348 Fax 703/264-9222

EPA USEPA Contract Laboratory Program
Inorganic Traffic Report & Chain of Custody Record

Case No: 31029

DAS No: R31295

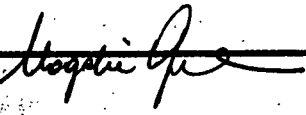
R

Region: 3 Project Code: Account Code: 02T03N50102D037ZLA00 CERCLIS ID: MDD985407196 Spill ID: Site Name/State: Elkton Farm/MD Project Leader: Alex Cox Action: Expanded Site Investigation/RI Sampling Co: MDE	Date Shipped: 10/9/2002 Carrier Name: FedEx Airbill: 835304998550 Shipped to: Sentinel Inc. 116 Washington Street, NE Huntsville AL 35801 (256) 534-9800	Chain of Custody Record <table border="1"> <tr> <th>Relinquished By</th> <th>(Date / Time)</th> <th>Received By</th> <th>(Date / Time)</th> </tr> <tr><td>1</td><td></td><td></td><td></td></tr> <tr><td>2</td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td></tr> </table>	Relinquished By	(Date / Time)	Received By	(Date / Time)	1				2				3				4				Sampler Signature: 
Relinquished By	(Date / Time)	Received By	(Date / Time)																				
1																							
2																							
3																							
4																							

INORGANIC SAMPLE No.	MATRIX/ SAMPLER	CONC/ TYPE	ANALYSIS/ TURNAROUND	TAG No./ PRESERVATIVE/ Bottles	STATION LOCATION	SAMPLE COLLECT DATE/TIME		ORGANIC SAMPLE No.	QC Type
MC00S6	Subsurface Soil (>12") Magalie Gelin <i>MG</i>	L/G	TM/CN (21)	1267 (Ice Only) (1)	SS1	S: 10/9/2002	9:48 1000	C00S6	-
MC00S8	Subsurface Soil (>12") Alex Cox <i>AC</i>	L/G	TM/CN (21)	1275 (Ice Only) (1)	SS11	S: 10/9/2002	12:15	C00S8	-
MC00T2	Subsurface Soil (>12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1291 (Ice Only) (1)	SS2	S: 10/9/2002	12:55	C00T2	Spike
MC00T4	Subsurface Soil (>12") Magalie Gelin <i>MG</i>	L/G	TM/CN (21)	1299 (Ice Only) (1)	SS4	S: 10/9/2002	14:40	C00T4	-
MC00T6	Subsurface Soil (>12") Magalie Gelin <i>MG</i>	L/G	TM/CN (21)	1307 (Ice Only) (1)	SS6	S: 10/9/2002	13:00	C00T6	-
MC00T9	Subsurface Soil (>12") Phillip Anderson <i>PA</i>	L/G	TM/CN (21)	1319 (Ice Only) (1)	SS9	S: 10/9/2002	10:40	C00T9	-

OCT 2002

2002

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC: MC00R1, MC00S0	Additional Sampler Signature(s):  	Chain of Custody Seal Number:
Analysis Key: CN = Cyanide, TM = CLP TAL Total Metals, TM/CN = CLP TAL Total Metals and Cyanide	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment Iced?

TR Number: 3-592370820-100902-0003

PR provides preliminary results. Requests for preliminary results will increase analytical costs.

Send Copy to: Sample Management Office, 2000 Edmund Halley Dr., Reston, VA. 20181-3400 Phone 703/264-9348 Fax 703/264-9222

U.S. EPA Region III Sample Scheduling Request Form

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RAS CASE No: CT1497 31029		DAS No:		NSF No:	
Date: 10/01/02		Data Validation Level: M3, IM2		EPA Lab Reply:	
Site Name: Elkton Farm				Cost:	
Address: 183 Zeitler Road			City: Elkton		State: Maryland
Latitude: 393800		Longitude: 755300		Anal +Val Data TAT:42 DAYS	
Program: CERCLA		CERCLIS No: MDD985407196		Activity: SI	
Account No: ⁸⁰⁰³ 82T03N50102D037ZLA00		Operable Unit:		Spill ID:	
Preparer: Chris Hartman		RPM/PO: Lorie Baker		Site Leader: Alex Cox	
Phone: 410-537-3453		Phone: 215-814-3355		Phone: 410-537-3493	
FAX: 410-537-3472		FAX:		FAX: 410-537-3472	
E-mail: chartman@mde.state.md.us		E-mail:		E-mail: acox@mde.state.md.us	
EPA CO:		Contract Type:		Prime: MDE Sub:	
Lab Assignment Date:		Analytical TAT: 21 DAYS		Ship Date From: 10/8/02	
Organic Lab: Ceimic				Ship Date To: 10/10/02	
Inorganic Lab: Sentin				Carrier:	
SAMPLES	METHOD	PARAMETER		MATRIX	
40	OLM04.2	TCL (VOCs, BNAs, Pest/PCBs)		SOIL/SED	
16	OLM04.2	TCL (VOCs, BNAs, Pest/PCBs)		AQ	
3	OLM04.2	VOC		AQ	
40	ILM04.1	TM+CN		Soil	
16	ILM04.1	TM+CN		AQ	
7	ILM04.1	DM		AQ	

NOTE: Data validation levels M3 & IM2 require justification. QC field samples must be included as part of total number of samples.

1. Special Instructions:
2. Objectives / Project Plan ID / Permit ID:
3. Program / Project / Permit Reporting Limits
4. DQO (QC Requirements)



Chris Hartman
<CHartman@mde.state.md.us>

10/31/02 03:29 PM

To: Lisa Penix/ESC/R3/USEPA/US@EPA, Alex Cox
<ACox@mde.state.md.us>
cc: Betty Jeffery/ESC/R3/USEPA/US@EPA, Dan
Slizys/ESC/R3/USEPA/US@EPA, Chris Hartman
<CHartman@mde.state.md.us>
Subject: Re: 31029 - Elkton Farm- inorganics

Issue #1

Duplicate Samples:

MC00Q1 - SW6 (Duplicate of SW2)

MC00Q8 - S12 (Duplicate of S5)

MC00S9 - SS12 (Duplicate of SS5)

Issue #2

Wrong Times:

The traffic report (TR # 3-592370820-100902-0003) indicated the incorrect sample times. (The two sample times were transposed).

MC00Q5 (S1) was collected at 0940 as indicated on the tag and bottle label.

MC00S6 (SS1) was collected at 1000 as indicated on the tag and bottle label.

Issue #3

Unlisted Air Bill Numbers:

I am not sure, but I would presume that these are the samples that were originally shipped to the incorrect labs. These samples were then re-shipped to the correct labs. If in the future we need to provide COCs to the labs or any other documentation, just let us know. I am not sure if the CLP has established other procedures for samples which have been mis-shipped.

Chris Hartman, Geologist
Maryland Department of the Environment
Environmental Restoration and Redevelopment Program

>>> <Penix.Lisa@epamail.epa.gov> 10/30/02 12:58PM >>>
Hi Alex,

I have a few questions regarding this case. Sample numbers MC00Q1; MC00Q8 & MC00S9 are listed as field duplicates, but the duplicate pair is not given. I need a Memo-to-File for this case. The sampling time of 09:40 on sample tag number 1177, sample number MC00Q5, does not match the sampling time of 10:00 on TR # 3-592370820-100902-0003 for same. The sampling time of 10:00 on sample tag number 1267, sample number MC00S6, does not match the sampling time of 9:40 on TR # 3-592370820-100902-0003 for same. Also, Fed Ex air bill number 8355 0668 5817 is listed on the lab's DC-1 for samples received 10/9/02. This air bill number is not present on any TR's relevant to this case. Fed Ex air bill number 9187 4244 9041 is listed on lab's DC-1 for samples received on 10/10/02. This air bill number is not present on any TR's relevant to this case, but the lab included the original air bill with the data package. TR

VALIDATOR'S COPY

3-592370820-100902-0003 lists Fed Ex air bill 8350 0499 6550. This
air
bill number is not listed on any DC-1, nor is it present in the data
package as received by the lab. Please feel free to contact me
with
any questions.

Thanks,

Lisa D. Penix
ESAT RSCC
Lockheed Martin Environmental Services
EPA Environmental Science Center
701 Mapes Road
Fort Meade, MD 20755
Telephone (410) 305 - 3020
Telefax (410) 305 - 3095
email: Penix.Lisa@epamail.epa.gov

Sample Receipt

From: Sturdavant, Holly <Holly.Sturdavant@dyncorp.com>
To: Sentinel (E-mail) <sample_receipt@sentinellab.com>
Cc: Betty Ann Jeffery (E-mail) <jeffery.betty@epamail.epa.gov>; Dan Slizys (E-mail) <slizys.dan@epamail.epa.gov>; John Kwedar (E-mail) <kwedar.john@epamail.epa.gov>; Khin-Cho Thaung (E-mail) <thaung.khin-cho@epamail.epa.gov>
Sent: Tuesday, October 15, 2002 6:07 AM
Subject: Region 03 | Case 31029 | Lab SENTIN | Issue Multiple | FINAL

Pam,

Following is the resolution from Region 3 regarding the custody seal issue and the organic samples received for Case 31029. Per the Region, the lab should document the missing custody seal issue in the Case/SDG narrative. Also per the Region, the lab should send the organic samples to CEIMIC using Fed Ex third party billing number 130712860. The address for CEIMIC is:

CEIMIC Corporation
 10 Dean Knauss Drive
 Narragansett, RI 02882

Please let me know if you have any other questions or problems.

Thanks,
 Holly

Holly Rogers Sturdavant
 DynCorp Systems and Solutions, LLC
 CLP Coordinator for Regions 3 & 9
 703-264-9526
holly.sturdavant@dyncorp.com or holly.rogers@dyncorp.com

-----Original Message-----

From: Slizys.Dan@epamail.epa.gov [<mailto:Slizys.Dan@epamail.epa.gov>]
Sent: Tuesday, October 15, 2002 6:59 AM
To: Sturdavant, Holly; chartman@mde.state.md.us; acox@mde.state.md.us; Baker.Lorie@epamail.epa.gov
Cc: Betty Ann Jeffery (E-mail); John Kwedar (E-mail); Khin-Cho Thaung (E-mail)
Subject: Re: NEW ISSUE | Case 31029 | Lab SENTIN | Issue Multiple

Holly, Chris and Alex,

SENTIN should send the samples to CEIMIC using the third party air bill voucher provided to SMO by the field contractor. The COC seal issue and sample mis-shipment must be recorded in the case narrative by the lab.

Chris and Alex,

201

To preserve the integrity of samples, you must use chain of custody seals on the cooler lids. This is a CLP shipping requirement.

Dan Slizys

From: "Sturdavant, Holly"<Holly.Sturdavant@dyncorp.com>

To: Betty Jeffery/ESC/R3/USEPA/US@EPA, Dan Slizys/ESC/R3/USEPA/US@EPA, John Kwedar/ESC/R3/USEPA/US@EPA, Khin-Cho Thaung/ESC/R3/USEPA/US@EPA

cc:

Subject: NEW ISSUE | Case 31029 | Lab SENTIN | Issue Multiple

10/14/02 01:54 PM

The lab is still waiting on a response to this issue. Please advise on how the lab should proceed.

Thanks,
Holly

Holly Rogers Sturdavant
DynCorp Systems and Solutions, LLC
CLP Coordinator for Regions 3 & 9
703-264-9526
holly.sturdavant@dyncorp.com or holly.rogers@dyncorp.com

-----Original Message-----

From: Sturdavant, Holly
Sent: Thursday, October 10, 2002 2:52 PM
To: Betty Ann Jeffery (E-mail); Dan Slizys (E-mail); John Kwedar (E-mail); Khin-Cho Thaung (E-mail)
Subject: NEW ISSUE | Case 31029 | Lab SENTIN | Issue Multiple

Following is an email from SENTIN regarding samples received today for Case 31029. There were no custody seals on the coolers. Also, the lab received two organic samples (this is the inorganic lab). Would the Region like the lab to send the organic samples to CEIMIC? SMO received third party billing number 130712860 from this sampler for another issue. Should the lab use this billing number?

Please advise on how the lab should proceed.

Thanks,
Holly

Holly Rogers Sturdavant
DynCorp Systems and Solutions, LLC

202

10/22/02

CLP Coordinator for Regions 3 & 9

703-264-9526

holly.sturdavant@dyncorp.com or holly.rogers@dyncorp.com

-----Original Message-----

From: Sample Receipt [mailto:sample_receipt@sentinellab.com]

Sent: Thursday, October 10, 2002 3:49 PM

To: Sturdavant, Holly

Subject: Case 31029

Hi Holly,

Here are a few issues concerning the samples we received today (10/10) for case 31029:

1. There were no custody seals on the cooler.
2. Two organic samples were sent with the inorganic samples. The sample ID #s on the two organic samples are C00R5 and C00S0.

Thanks,
Pam Muller

203

10/22/02

APPENDIX D

Laboratory Case Narrative

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: MC00P7

SOW No.: ILM04.1

EPA SAMPLE NO.

Lab Sample ID.

MC00P6

47146S

MC00P7

47122S

MC00P8

47123S

MC00P9

47124S

MC00P9D

47124S2

MC00P9S

47124MS

MC00Q0

47125S

MC00Q1

47126S



Were ICP interelement corrections applied?

Yes/No YES

Were ICP background corrections applied?

Yes/No YES

If yes-were raw data generated before
application of background corrections?

Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name: BAK:1 Sure

Title: QMR

Date: 10/23/02

COVER PAGE - IN

ILM04.1

SDG NARRATIVE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: MC00P7

SOW No.: ILM04.1

SAMPLE RECEIPT: Temperature Blank: PRESENT ☒ ABSENT ☐

If a blank is absent, a non-invasive laser measurement is taken using a sample.

Cooler temperature(s) recorded via laser measurement were: 2.0, 6.5, 1.0°C

Refer to Record of Communication (ROC) regarding EPA Sample # discrepancies for samples:

Refer to ROC regarding tag discrepancies for samples:

Refer to ROC regarding sample preservation discrepancies for samples:

MC00P7
↓
Q1Refer to ROC regarding custody seal discrepancies.QC Specified: Yes ☒ No ☐ If no, chose: _____

ANALYSIS: The following analyte(s) were estimated due to possible matrix interferences:

K

DOCUMENT CONTROL: The following invalid defects resulted due to CCS program anomalies:

Initial Assessment: 1098 - SOW missing/invalid (Caused by ILM04.1 SOW)

Full Assessment:

AP03.2 + AP05.2 are invalid defects; 50 ml volume allowed

OTHER: _____

Signature: [Signature]Name & Title: BKR.1 SOW[Signature]Date: 10/23/02

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: MC00Q8

SOW No.: ILM04.1

EPA SAMPLE NO.

Lab Sample ID.

MC00Q5	47147S
MC00Q6	47148S
MC00Q7	47149S
MC00Q8	47127S
MC00Q9	47128S
MC00R0	47129S
MC00R1	47150S
MC00R1D	47150S2
MC00R1S	47150MS
MC00R2	47130S
MC00R3	47151S
MC00R4	47131S
MC00R5	47152S
MC00R7	47132S
MC00S1	47133S
MC00S2	47134S
MC00S3	47135S
MC00S4	47136S
MC00S5	47137S
MC00T3	47138S
MC00T5	47139S
MC00T8	47140S

Were ICP interelement corrections applied?

Yes/No YES

Were ICP background corrections applied?

Yes/No YES

If yes-were raw data generated before
application of background corrections?

Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name:

Title:

Date:

10/22/02

COVER PAGE - IN

ILM04.1

SDG NARRATIVE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: mc0008

SOW No.: ILM04.1

SAMPLE RECEIPT: Temperature Blank: PRESENT ☒ ABSENT ☐

If a blank is absent, a non-invasive laser measurement is taken using a sample.

Cooler temperature(s) recorded via laser measurement were: 1.0, 2.0, 6.5 °C

Refer to Record of Communication (ROC) regarding EPA Sample # discrepancies for samples:

Refer to ROC regarding tag discrepancies for samples:

Refer to ROC regarding sample preservation discrepancies for samples:

Refer to ROC regarding custody seal discrepancies.

QC Specified: Yes ☒ No ☐ If no, chose: _____

ANALYSIS: The following analyte(s) were estimated due to possible matrix interferences:

Ca, K, Mg

DOCUMENT CONTROL: The following invalid defects resulted due to CCS program anomalies:

Initial Assessment: 1098 - SOW missing/invalid (Caused by ILM04.1 SOW)

Full Assessment: _____

OTHER: _____

Signature: [Signature]Name & Title: Baril GureDate: 10/22/02 2

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: MC00R6

SOW No.: ILM04.1

EPA SAMPLE NO.

Lab Sample ID.

MC00R6

47153S

MC00R8

47154S

MC00S0

47155S

MC00S0D

47155S2

MC00S0S

47155MS

MC00S6

47156S

MC00S8

47157S

MC00S9

47172S

MC00T2

47158S

MC00T4

47159S

MC00T6

47160S

MC00T9

47161S

Were ICP interelement corrections applied?

Yes/No YES

Were ICP background corrections applied?

Yes/No YES

If yes-were raw data generated before
application of background corrections?

Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature:

Name:

Baril Swa

Title:

QMOB

Date:

10/25/02

SDG NARRATIVE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: Sentinel, Inc.

Contract: 68-W-00-085

Lab Code: SENTIN

Case No.: 31029

SAS No.:

SDG No.: MC00R6

SOW No.: ILM04.1

SAMPLE RECEIPT: Temperature Blank: PRESENT 1042 / ABSENT 1042

If a blank is absent, a non-invasive laser measurement is taken using a sample.

Cooler temperature(s) recorded via laser measurement were: 1.0, 9.5°C

Refer to Record of Communication (ROC) regarding EPA Sample # discrepancies for samples:

Refer to ROC regarding tag discrepancies for samples:

Refer to ROC regarding sample preservation discrepancies for samples:

Refer to ROC regarding shipping discrepancies for samples: MC0059

Refer to ROC regarding custody Seal discrepancies. - no evidence of tampering

QC Specified: Yes ☒ No ☐ If no, chose: _____

ANALYSIS: The following analyte(s) were estimated due to possible matrix interferences:

DOCUMENT CONTROL: The following invalid defects resulted due to CCS program anomalies:

Initial Assessment: 1098 - SOW missing/invalid (Caused by ILM04.1 SOW)

Full Assessment: _____

OTHER: _____

Signature: [Signature]Name & Title: Bruce [Signature]Date: 10/25/02